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ABSTRACT OF THE DISCLOSURE

Techniques are provided for generating three-dimensional images, such as may be used in mammography. In accordance with these techniques, projection images of an object of interest are acquired from different locations, such as by moving an X-ray source along an arbitrary imaging trajectory between emissions or by individually activating different X-ray sources located at different locations relative to the object of interest. The projection images may be reconstructed to generate a three-dimensional dataset representative of the object from which one or more volumes may be selected for visualization and display. Additional processing steps may occur throughout the image chain, such as for pre-processing the projection images or post-processing the three-dimensional dataset.